



REMEDIATION WORK PLAN (RWP) CHECKLIST

State Form 53413 (R2 / 5-24)
 IC 13-25-4 and 13-25-5
 Indiana Department of Environmental Management
 Office of Land Quality

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Attention: Remediation Services Branch
 Office of Land Quality
 100 N. Senate Ave., IGCN 1101
 Indianapolis, IN 46204-2251
 or enroll in [IDEM's e-submission portal](#)

INSTRUCTIONS:

1. The purpose of the RWP is to propose a remedy or remedies for a release and demonstrate how and why the proposed remedy is likely to adequately control risks to human health and / or the environment arising from the release.
2. This form is intended to assist with the organization of the RWP for either the State Cleanup Program (SCP) or the Voluntary Remediation Program (VRP).
3. The RWP Checklist should be attached as a cover to your RWP.
4. Depending on the nature of the project, some of the following sections in the RWP Checklist may not be applicable. If this is the case, do not leave the section blank, omit, or reorder the checklist items. Instead, enter "Not Applicable" or other explanation to indicate that the section does not apply or that information is not available.
5. Submit one electronic copy of the RWP using the Program's e-Submission portal.
6. The RWP is required for VRP under [IC 13-25-5-7](#).

SITE INFORMATION	
Name:	
Street Address:	
City / County / ZIP Code:	
Universal Transverse Mercator (UTM) Coordinates:	
Program: <input type="checkbox"/> State Cleanup <input type="checkbox"/> Voluntary Remediation	Project Number:
CONTACT INFORMATION	
Contact Responsible for Remediation Project (SCP Responsible Party or VRP Applicant)	
Name:	
Street Address:	
City / County / ZIP Code:	
E-mail Address:	Telephone Number:
Environmental Consultant Information	
Company Name:	Contact Person:
Street Address:	
City / County / ZIP Code:	
E-mail Address:	Telephone Number:
Other Parties Copied (attorney, property owner, etc.)	
<i>Name, title, company, contact information</i>	

Element	Location in Document
I. INTRODUCTION AND OVERVIEW	
1. Site History	
Type of facility, including description of past and present operations	
Hazardous materials used or stored on-site	
Site ownership and operational history	
Site spill, release, and contamination history	

2. Previous Site Investigations / Remedies	
History with other state remedial programs	
Overview of project history, including release discovery, subsequent investigations and remedial actions, and location of relevant documents describing the preceding activities	
3. Remediation Objectives	
Identify IDEM guidance used for the project and remediation / cleanup objectives for all affected media, contaminants, and exposure pathways	
Overview of proposed remedy or remedies	
Summary how the proposed remedy or remedies will ensure remediation objectives are met	
II. CHARACTERIZATION	
1. Geologic Information	
Location, setting, and physiographic description of project area	
Baseline geologic and hydrogeologic summary	
Summary of site-specific geology and hydrogeology	
2. Source Identification	
Release source(s) and evidence for identification of source(s)	
Approximate area impacted	
Media impacted	
Preferential pathway evaluation, including sewer investigation <i>sewer location, depth, intersection with water table, etc.</i>	
3. Nature of Release	
Identity of released chemical(s) <ul style="list-style-type: none"> <i>i. Chemical and physical properties,</i> <i>ii. Contaminant toxicological data, and</i> <i>iii. Potential effects of residual contamination</i> 	
Evidence supporting identification of released chemical(s)	
Methods used to screen, collect, handle, and analyze samples	
4. Extents of Release:	
Field screening results for all sampled media	
Discussion of the horizontal and vertical extent of contamination in all affected media	
Discussion of concentrations changing over time	
Discussion of extents changing over time	
Results of vapor intrusion investigation(s) of structures	
Delineation of sewer vapors	
III. RISK EVALUATION	
1. Risk Overview	
List of decision units	
Representative concentrations of release-related chemicals (RRCs) in each decision unit, along with description of how those concentrations were derived	
Identification of potential pathways of exposure <ul style="list-style-type: none"> <i>i. Surface and Subsurface Soil</i> <ul style="list-style-type: none"> <i>▪ Direct Contact and</i> <i>▪ Soil Leaching</i> <i>ii. Groundwater</i> <i>iii. Surface Water</i> <i>iv. Soil Gas</i> 	

<ul style="list-style-type: none"> ▪ <i>Source identification</i> ▪ <i>Extent delineation</i> <p>v. <i>Vapor Intrusion</i></p> <ul style="list-style-type: none"> ▪ <i>Affected structures</i> ▪ <i>Sewer vapor sampling</i> 	
2. Susceptible Areas	
Nearest drinking water source & wellhead protection areas (WHPA)	
<ul style="list-style-type: none"> i. <i>Where is the nearest drinking water source?</i> ii. <i>Is this site within a WHPA? What is the Time of Travel (TOT)?</i> 	
Geologically susceptible areas, such as surface water bodies and karst bedrock areas	
Socially susceptible areas: nearby residences, schools, daycares, parks, assisted living communities, and hospitals	
Ecologically susceptible areas that include habitats of concern, like wetlands, caves, and parklands	
3. Risk Determination	
Existing and likely future land use at each decision unit	
Land use restrictions, if any, currently in place on decision units	
Remediation objectives proposed for each decision unit	
Comparison of representative concentrations against unconditional remediation objectives for each decision unit	
Discussion of any lines of evidence applicable to remedy decisions for each decision unit, and overall rationale for remedy necessity decisions	
List of decision units requiring a remedy	
IV. REMEDY SELECTION AND IMPLEMENTATION	
1. All Remedies	
<p>Description of proposed remedy or remedies and how they will work, including institutional controls. If remedies differ across decision units, describe the remedies proposed for each decision unit</p> <ul style="list-style-type: none"> i. <i>Technical specifications of all equipment and processes,</i> ii. <i>Proposed locations of all remediation equipment on a scaled site map, including piping runs and electrical wiring,</i> iii. <i>State or federal permit requirements for the system, and</i> iv. <i>Waste disposal approvals needed to implement system</i> 	
<p>Data management details, including a discussion of how the monitoring and confirmation sampling data will be documented and reported</p> <p>Refer to State Form 57327</p>	
Provide contingent remedies to be completed in the event the proposed primary remedy fails at completing remediation objectives	
<p>Project timeline:</p> <ul style="list-style-type: none"> i. <i>Implementation of proposed remedy,</i> ii. <i>Sampling and monitoring frequency,</i> iii. <i>Schedule for submitting results to IDEM for review and evaluation (quarterly progress reporting is the minimum requirement),</i> iv. <i>Implementation of the contingent remedies if proposed remedy fails, and</i> v. <i>Anticipated date of project completion</i> 	
2. Active Remedies	
Proposed metrics for demonstrating the effectiveness of the remedy	
Discussion of possible adverse effects associated with remedy implementation, if any (e.g., methane generation), and how those potential scenarios will be addressed	
3. Engineered Exposure Controls	
Evidence that the proposed control is likely to adequately address risk for as long as the RRCs exceed applicable remediation objectives	
Proposed metrics for demonstrating the effectiveness of the remedy	
V. INTENT TO SUBMIT A COMPLETION REPORT	

Statement that a Completion Report demonstrating adequate control of release-related risk will be submitted after successful RWP implementation	
VI. REFERENCES	
References cited, including author, full title, publisher, date, etc.	

Below is a list of attachments to be included with the RWP submission. Some projects may require more attachments than listed, and some may require less. Please include attachments as applicable.

Element	Location in Document
VII. FIGURES	
<i>If multiple figures are needed per line item, label them as such: Figure 1a., Figure 1b., Figure 1c., etc. Figures should be appropriately scaled and include:</i>	
Figure 1. Site Location Map showing township, range, and section on a 7.5-minute quadrangle United States Geological Survey (USGS) topographic map	
Figure 2. Site Vicinity Map(s) showing the site and surrounding properties and property lines, site current and historic buildings / structures, roads, etc.	
Figure 3. Site Detail Maps showing: <ul style="list-style-type: none"> i. Site property lines, ii. Building outlines, iii. Utility lines (on and surrounding the site, including television or communication cables, gas pipes, sewer lines, water pipes, electric lines, storm and sewer drain locations, etc.), iv. Known or suspected source areas, v. Underground / aboveground storage tank (UST / AST) locations, vi. Groundwater monitoring well network, vii. Production wells, viii. Completed remediation activities, including: <ul style="list-style-type: none"> ▪ Injection locations, ▪ Soil excavation boundaries for remediation system equipment (trenches, piping, etc.), and ix. Other surface and subsurface features as applicable. 	
Figure 4. Groundwater Flow Map(s) showing groundwater elevations, flow direction(s), and potentiometric surface contours. Separate into separate figures for each water bearing zone / aquifer (if applicable)	
Figure 5. Groundwater Analytical Results Map(s) for all RRCs (if applicable)	
Figure 6. Soil Analytical Results Map(s) for all RRCs (if applicable)	
Figure 7. Vapor Analytical Results Map(s) for all RRCs (if applicable)	
Figure 8. RRC Plume Map(s) – Use separate isoconcentration line figures for each RRC per affected media and each depth (shallow and deep) <i>State the software used to generate the plume maps</i>	
Figure 9. Geologic cross-sections <ul style="list-style-type: none"> i. An adequate number of cross-sections should be provided. Include an overview map that depicts lines of transects on an appropriately scaled map. Various orientations (for example, in direction of groundwater flow and orthogonal to groundwater flow) should be used and should cross the areas of highest reported concentrations. ii. Each cross-section should depict, at a minimum: <ul style="list-style-type: none"> ▪ Depth, thickness, classification, and hydraulic characteristics of each unit, ▪ Location and depth(s) of suspected or known source area(s), ▪ Location and depth of each boring and / or monitoring well screen, ▪ Boring log screening results, ▪ Horizontal and vertical extents of contamination above IDEM Published Levels illustrating the extents relative to unconditional remediation objectives for all affected media (soil vapor, soil, and groundwater), ▪ Building footprints, fill boundaries, and thickness, ▪ Utility conduits showing estimated depth, ▪ Water table and / or potentiometric surface, ▪ Structures such as zones of fracturing that influence water movement, ▪ Depth to top of bedrock if karst or shallow bedrock are present, ▪ Compass orientation of cross-section, and ▪ Legend iii. Cross section legend should include: 	

<ul style="list-style-type: none"> ▪ <i>Horizontal and vertical scales,</i> ▪ <i>Lithography symbol definitions, and</i> ▪ <i>Date of groundwater elevation measurements</i> 	
Figure 10. Map(s) identifying structures for which vapor intrusion investigation has been completed	
Figure 11. Map(s) of proposed remediation areas and location(s) of any major equipment, i.e. system extraction wells and conveyance piping, injection point locations, excavation areas, etc.	
Figure 12. Conceptual Site Model Diagram	

Element	Location in Document
VIII. TABLES	
<i>Tables should be formatted following State Form 57327 guidelines</i>	
Table 1. Current and historic groundwater gauging and groundwater elevation data	
Table 2. RRC current and historic groundwater analytical results	
Table 3. RRC current and historic soil analytical results	
Table 4. RRC current and historic vapor analytical results	

Element	Location in Document
IX. APPENDICES	
Appendix A. DNR Well Map(s) and Records	
Appendix B. Boring logs and monitoring well construction logs	
Appendix C. Laboratory data reports of sufficient quality to support project objectives. (Virtual File Cabinet (VFC) content identification numbers are acceptable for previously submitted data) R2 section 2.2.9: Data Reporting	
Appendix D. Remediation Design Information	
Appendix E. Operation, Maintenance, and Monitoring Plan – Include at minimum, the information below. Refer to the IDEM R2 for additional information. <ul style="list-style-type: none"> <i>i. Optimal operating conditions,</i> <i>ii. Necessary O&M tasks, their frequency, replacement schedule & planned O&M replacement events,</i> <i>iii. Proposed inspection schedule,</i> <i>iv. If the plan includes vapor mitigation system(s), a long-term indoor air monitoring schedule must be included,</i> <i>v. Potential problems and their remedies, and</i> <i>vi. Contingency plan indicating how the Applicant / Responsible Party plans to respond in the event of a system failure, including the following information:</i> <ul style="list-style-type: none"> ▪ <i>Description of alternate operation procedures to prevent undue hazards if the system fails,</i> ▪ <i>Notification procedure for system shutdown or failure, and</i> ▪ <i>System modification procedures</i> 	
Appendix F. Quality Assurance Project Plan (QAPP) <i>VFC content identification numbers are acceptable for previously submitted data</i>	
Appendix G. Project-specific Health and Safety Plan	
Appendix H. Institutional Controls <ul style="list-style-type: none"> <i>i. List of restrictions to be used in the Environmental Restrictive Covenant (ERC),</i> <i>ii. List of engineered barriers proposed, and</i> <i>iii. Environmental Restrictive Ordinance to be relied upon.</i> 	
Appendix I. Community Relations Plan <ul style="list-style-type: none"> <i>i. Mailing list of adjacent or affected properties; interested community groups; and local, state, and national officials (e.g., mayor, local newspaper, County health department, representatives, and senators),</i> <i>ii. Copy of the RWP notification letter to be sent to the above groups and individuals,</i> 	

<ul style="list-style-type: none"> iii. <i>List of nearby sensitive communities: schools, daycares, parks, assisted living communities, hospitals, etc.,</i> iv. <i>Name and address of local library that will be the repository for the Remediation Work Plan during the public notice period,</i> v. <i>Discussion of plans to hold public information meetings about the project and proposed remedy, including meeting format, proposed public meeting schedule, and notification procedures,</i> vi. <i>Discussion of plans to prepare and distribute information bulletins regarding the project and proposed remedy, including format and types of information included in the bulletins,</i> vii. <i>Description of the types of media (e.g., newspaper, broadcasters) that will be contacted to help inform the general public, and the type of information to be released to the media, and</i> viii. <i>Area map including any properties receiving a notification letter, sensitive communities, and the library repository.</i> 	
<p>Appendix J. Notice of Contamination in Right of Way form, if applicable</p> <p>State Form 57234</p>	
<p>Appendix K. If naturally occurring background is proposed as a remediation objective, maps, tables, and calculations showing background sample locations, sample results, and background threshold value(s) must be submitted</p>	
<p>Appendix L. For remedies that require financial assurance: Full text version of the proposed financial assurance instrument</p> <p>R2 Appendix G: Financial Assurance</p>	
<p>Appendix M: Pilot study results</p>	

<p>Resources:</p> <p><i>Risk-Based Closure Guide (R2)</i></p> <p><i>R2 acronyms list</i></p> <p><i>SCP Guide (WASTE-0076-NPD)</i></p> <p><i>VRP Guide (WASTE-0077-NPD)</i></p>
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